Elements for a cultural history of wood in southern France (Xth-XVIth centuries)

Aline Durand

ELEMENTS FOR A CULTURAL HISTORY OF WOOD IN SOUTHERN FRANCE (XTH-XVITH CENTURIES)

Aline Durand

Department of History,
University of Provence (Aix-Marseille I)
29 avenue R. Schuman F.-13621 Aix-en-Provence cédex 1
adurand@mmsh.univ-aix.fr

in

SECOND INTERNATIONAL MEETING OF ANTHRACOLOGY (PARIS SEPTEMBER 2000),

BRITISH ARCHAEOLOGICAL REPORTS, INTERNATIONAL SERIES, IN PRESS

Abstract

Up to now, the study of the role of wood in rural architecture from southern France, during the Middle Ages, has remained a marginal investigation subject, as stone has always been considered as omnipresent. Charcoal analysis of building remains allows us to prepare the ground for an history of wood during the Middle Ages. The spectrum of woods used in southern rural buildings is quite large as shown by taxa recognized: *Castanea sativa*, deciduous mediterranean *Quercus*, *Fraxinus sp.*, *Fagus sylvatica*, *Ulmus minor*, *Salix-Populus* sp., *Pinus* type *sylvestris*, *Abies alba*. However, and according to our study, from the year 1000 until the beginning of modern times, only one species is mainly used, for building purposes, as a result of technical, economical, and biogeographical reasons – deciduous oak. The other species are used very occasionally, to answer specific needs, or as a result of their abundance and proximity. In fact, all species used were growing in the vicinity of the settlements: the use of timber from further afield has not been documented. Villagers, builders or other specialist workers adapt their needs to the local possibilities: they choose the most suitable woods for construction but also the cheapest ones. Certain observations of wood transverse sections and measurements of wood diameter prove that specimens have also been carefully chosen. Sometimes, wood management strategies seem to have been developed. Further charcoal analyses will hopefully support and enrich these first data and a better understanding of wood uses during the medieval period will be achieved.

In memory of Jean-Marie Pesez

In the seventies, a great archeological European survey on deserted medieval and modern villages was carried out in the whole of Europe (Villages 1965, Pesez 1965, Démians d'Archimbaud 1980). In this perspective, it appears natural to the supporters of material culture, to attract interest to the building materials of the peasant's house. In France, this subject has been gradually integrated into archeological medieval investigations. Important changes have taken place between the first meeting of Besançon in 1972 (Besançon, 1973) and the recent synthesis *One hundred medieval houses* (Esquieu et Pesez dir. 1998), as the scientific community lost interest in the monumental construction and recognized the importance of simple soil remains. The woody remains of rural architecture are often found charcoalified during excavation work: laths, beams, battens, frames, fences, even agricultural tools and so on. Charcoal analysis of such artefacts contributes to a better understanding of how plant species were used, of forest management and, occasionally, of conditions of transport.

At first sight, the role of wood in rural architecture of the southern regions seems very marginal, as stone has been considered as an omnipresent building material. In fact, this is not true. First of all, written documents from the 12th century mention wooden houses, i. e. completely built with wood, both in Camargue, and in the hills of the 'Biterrois' (area around Béziers) (Durand 1998). Also, during the last decade, excavation work carried out in southern France uncovered hut floors dating back to the VIIIth-XIIth century entirely built with perishable materials both in rural contexts and urban contexts (Ginouvez 1995, Garnier et al. 1995, Mercier et Raynaud 1995, Schneider et al. 1995). The use of wood as building material seems to have been more important than previously thought by historians.

I.- SOUTHERN CHRONO-TYPOLOGY (XTH-XVITH CENTURIES) (TABL.1, FIG 1-2)

1.- The first feudal fortified sites (Xth-XIIth centuries)

Up to now, fortified sites from the first feudal age provided very few samples of this kind. As a consequence their study appears particularly interesting.

A study of this kind has been carried out at Le Mourrel, a feudal moat and bailey castle at Molleville, in the 'Lauraguais' (Aude, 11). On the summital platform, 19 pieces of charcoal were found inside a post hole. All of them were identified as deciduous oak.

East of Forcalquier (Basses-Alpes, 04) in the French Prealps, the moated site of Niozelles was also recently excavated. It may be included in the generation of the first feudal fortifications as one of the occupation phases has been dated Xth-XIth century. Several phases of occupation have been distinguished by the excavation work. The charrred woods are issued from layers concerning the transformation of the site : they belonged to the wooden outhouse near one of the habitation structures situated on the top of the moated site. Charcoal analysis results are based on the identification of 303 charcoal specimens from this outhouse. 298 of them were identified as deciduous mediterranean oak (*Quercus* type *pubescens*). The specific discrimination of deciduous oaks is very difficult, often quite impossible, based on wood anatomy alone. However, and based on site ecology and biogeography, the samples recognized here as deciduous oak are refered to as mediterranean deciduous oak (*Quercus* type *pubescens*).

In the Buech valley in the 'Gapençais' (Hautes-Alpes, 05), the rural dwelling of Oze provided charred elements of a wooden construction. These are considered to be remains from beams or battens found on the occupation soil dated Xth-XIIth. Charcoal fragments have been photographied and drawn in the site. The study of 482 fragments allowed us to identify 10 different taxa. Most of the fragments have been assigned to four species: *Pinus* type *sylvestris*, *Salix sp., Fagus sylvatica* and *Quercus* type *pubescens*. Two major results can be pointed out and corroborate archeological observations. First, charcoal analysis has identified only very few taxa (10). This relative specific poverty and the dominance of only four taxa (beech, oak, pine and willow) is characteristic of an ethnobotanical spectrum, not of a paleoenvironmental one. Anthracological data agree with the archeological data in considering these remains as vestiges of a building, not of domestic fires. Secondly, clear traces of wood work have been noticed : cut in edge, quadrangular cut with characteristic decentring of wood medulla. The gymnosperms (pine and fir) present anatomical deformations of ligneous tissues. Close to the growth ring boundary, ligneous rays are deviated obliquely in earlywood and tracheids compressed but without rupture. Latewood appears often unchanged; however, in some cases cellular bands of latewood are also deviated obliquely. According to I. Théry (Théry 1983), this kind of deformation is classified "type 1b" and is not a result of carbonization nor specific growing conditions. At Oze, these features are very rare and observed on soft wood only : maybe the wood had supported a heavy load. These data may provide evidence that we are dealing with artifacts, not with scattered charcoal of domestic fires.

So, in these three southern sites dating back to c. 1000 AD, deciduous oak is the major species used as timber.

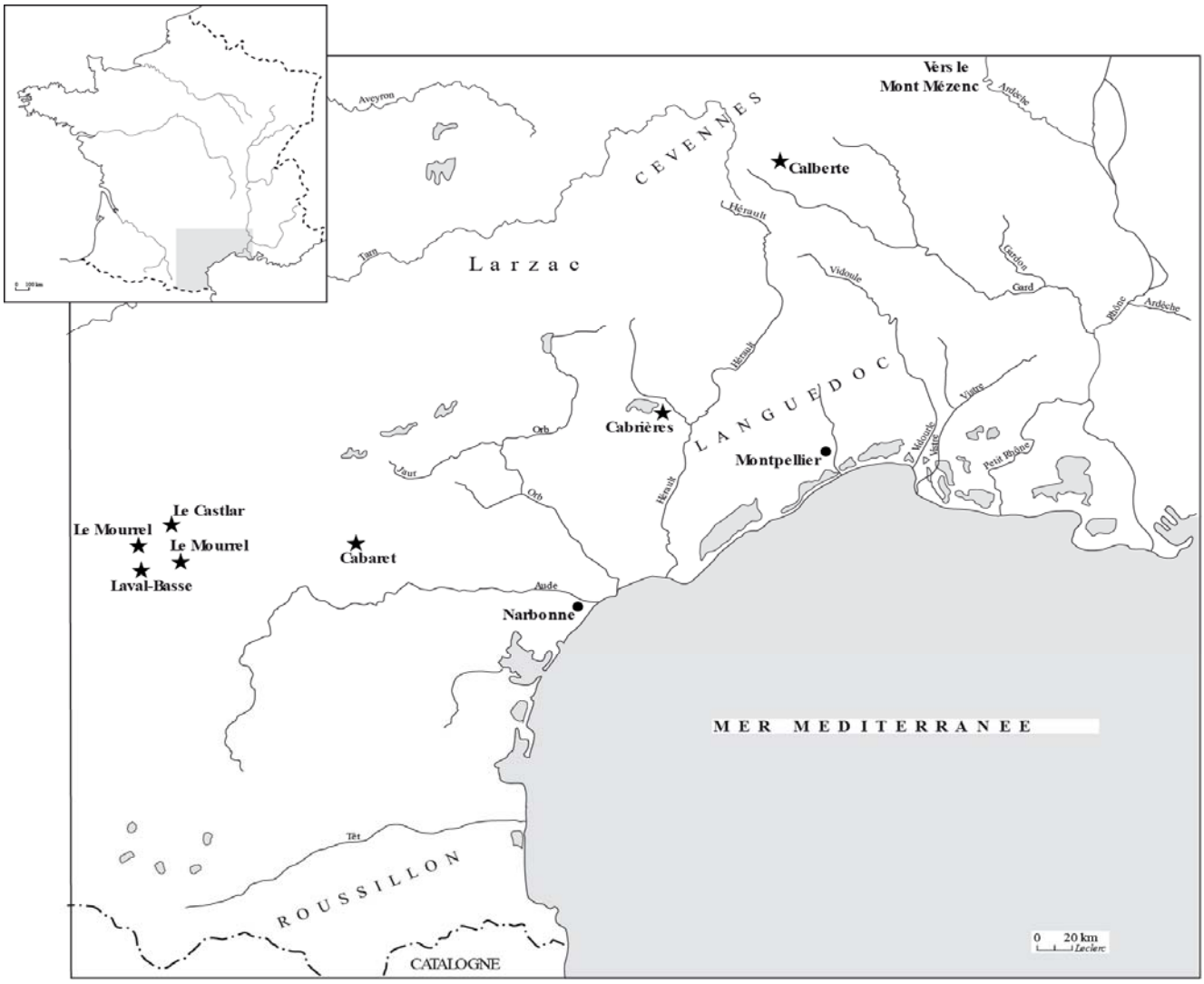

Fig 1 Location of sites in Languedoc

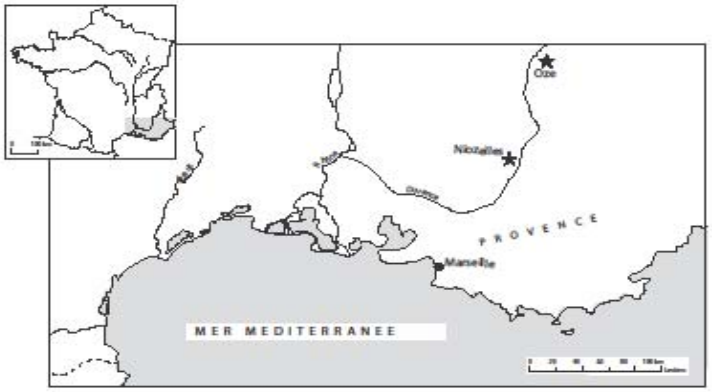

Fig 2 Location of sites in Provence

	Xth-Xth c.	**XIth-XIIth c.**	**XIth-XIIth c.**	**XIIth c.**	**XIIIth-XIVth c.**	**XIIIth-XIVth c.**	**XIVth c.**	**XVIth c.**
TAXA	**Niozelles**	**Oze**	**Le Mourrel**	**Cabaret**	**Laval-Basse**	**Laval-Basse**	**Le Castlar**	**Cabrières**
	Remains of	Remains of	Post	Ligneous	Levels of	Remains of	Timbering	Remains of
	construction	construction	hole	artefact	destruction	structure	of store house	construction
Abies alba		11						
Acer sp.				4				
Acer monspessulanum		4						
Angiospermae	1							
Buxus sempervirens	1							
Castanea sativa-Quercus pubescens								9
Castanea sativa								52
Corylus avellana				2			24	
Crataegus sp.-Sorbus sp.	3							
Erica sp.						1		
Fagus sylvatica		130			1		19	
Ficus carica					1			
Fraxinus sp.		2						
Fraxinus oxyphylla.								5
cf. Juniperus sp.		1						
Juniperus sp.		2						
Leguminosae		6		1				
Ligustrum vulgare							5	
Pinus type *sylvestris*		53						
cf. Populus sp.					1			
Populus sp.					2			
Prunus sp.					1			
Prunoideae type *Prunus avium*		18						
Prunus avium					1			
Prunus amygdalus					1			
Prunus cf. amygdalus					1			
Prunus spinosa					1			
Quercus ilex-coccifera				14				16
Quercus deciduous			19		15		1497	
Quercus sp.-Castanea sativa		1						
Quercus type *pubescens*	297	174		534		15		395
Quercus type *sessiliflora-pedunculata*					2			
Salix sp.-Populus sp.		3						
Salix sp		72					9	
Sorbus sp.					1		4	
Tilia sp.							1	
Ulmus minor					12			4
cf. Viburnum sp.				3				
Vitis vinifera sp.						1	4	
Bark or knot	1	3		11	1			
Undeterminate		1						
Undeterminable		1		13	3			
TOTAL	303	482	19	582	45	17	1563	481

Tab. 1 Absolute frequencies of taxa (remains of construction)

	Datation	*Angiospermae*	*Buxus*	*Quercus*	*Crataegus sp.*	Knot	TOTAL
		undeterminable	*sempervirens*	type *pubescens*	*Sorbus sp.*		
SE1							
layer 138	begining of XIth c.			11	1	1	13
layer 139	late Xth c.			32			32
E1 layer 224	late Xth c.	1	1	16	2		20
SE2 layer 141	begining of XIth c.			216			216
SO1							
layer 215	begining of XIth c.			22			22

Tabl. 2 Observation of charcoal transverse sections at Niozelles (X-XIth)

2.- The 'castral' villages (XIIIth-XIVth)

Villages are now well established and developing ; no changes in the choice of building material is noticed. Previous anthracological spectra concerning timbers of sites occupied during the middle feudal period are not different from spectra based on early feudal sites.

At the moated village of Laval-Basse (Aude, 11), destruction levels, composed of yellow clayey soil, stones, tiles, charcoal and broken artifacts, have been identified. The study of 45 charcoal specimens allowed us to identify *Quercus* type *pubescens, Quercus* type *sessilifora-pedunculata, Salix sp., Sorbus sp., Ulmus minor* and *Vitis vinifera.* In one structure (n° 371) big pieces of deciduous oak may be considered as remains of carpentry work. In this site, and based on wood anatomy features, two different types of deciduous oak may be distinguished : one, mediterranean, with earlywood vessels arranged in only one layer and rounded cross section up to 200-300 µm, the other, atlantic, with earlywood vessels arranged in 2 or three layers and elliptic cross section up to 300-400 µm.

In Cabaret, one of the four castles of Lastours (Aude, 11), excavations have taken place in the lower part of the village, near the river. One of the buildings, dated XIIth century, provided a concentration of large pieces of charcoal. At first, these remains were believed to come from a beam. However, further research showed that they belong to a single ligneous artifact. This object had a round or oblong shape with a concave side which provide evidence of a carpenter or joiner's work. The study of 582 charcoal fragments testifies to the great importance of the deciduous mediterranean oak.

In the most westerly point of the Black Mountain, at Castlar of Durfort (Tarn, 81), archeologists have uncovered a store-house, dated end of XIIIth century / beginning of the XIVth century. All the harvested grain was in place and stocked by heaps (Ruas, sous presse). The charcoal fragments analysed are issued from the timbering of the structure which had fallen down as a result of a fire. This charcoal concentration was covered by a layer of tiles. One of the beams had nearly ten centimeters of diameter. Again, deciduous oak (*Quercus* type *pubescens* or *Quercus* type *sessiliflora-pedunculata*) is the major taxon among the 1497 charred fragments identified. *Fagus sylvatica, Corylus avellana* and *Salix sp.* are also present. The discrete, but clear presence of these taxa is believed to result from repairs or minor additions. They are considered marginal in the whole of the timber structure.

3.- Modern Times

Data from modern times confirm the predominance of deciduous oak in the southern peasant architecture. At Cabrières (Hérault, 34), an ancient castral site, new dwellings are built at the bottom of the hill. In the sixteenth century, several houses are aligned along a little street. Remains of wooden beams or battens have been discovered in one of them, under a layer of tiles. Some of them present very clear traces of nailing. Nails have actually been found in place. Among the 481 charcoal pieces analyzed, 395 have been identified as deciduous mediterranean oak. We must underline, however, that batten were also made out of *Quercus ilex-coccifera, Ulmus campestris, Fraxinus ornus-oxyphylla and Castanea sp*. This last species had never been found before: it is the first sure attestation of medieval chestnut used as timber in France. *Castanea sativa* has not been identified as timber wood neither in the Bassin Parisien (Dietrich 1989) nor in Roman time in southern France (Chabal 1997).

Conclusion

Anthracological studies concerning wood at its uses in medieval rural construction have provided the first significant results that must be enriched and refined by further work. It is clear that between the beginning of the 10th century and the end of the sixteenth century, deciduous oak, and not chestnut, as usually refered to in the literature, is chosen as building material, in the southern medieval villages. Our results clearly show that, in spite of its mechanical and physical properties, *Castanea sativa* is not used as timber during the Middle Ages. Timbers in medieval buildings, believed to belong to Chestnut wood are, in fact, an illusion. O. Rakham (Rakham 1980) provides a very simple explanation : the two genera have very similar wood anatomical features (just medullary rays discriminates *Castanea sativa* from deciduous *Quercus*) and may be easily mistaken. The following question has to be considered now : why is deciduous oak dominant ?

II.- THE MEDIEVAL TIMBERS IN SOUTHERN AREAS : FROM FELLING TO USE (XTH-XVITH CENTURIES)

Some anatomical characters observed during identification allow us to understand the uses of medieval timber and the 'forest culture' of the peasant population.

1.- The dominance of deciduous oak

During medieval times, the constant use of deciduous oak in rural buildings from southern areas may be easily explained. Its technical and physical qualities are well known: the very hard wood of deciduous oak does not warp, can bear pressures, flexions, crushings and offers very long monoxylem bearings; it also resists well to bad weather, humidity and time; last, but not least, its duramen, very rich in tannins, protects the wood against fongic and insect attacks. Because of these properties, this tree provides an excellent wood for a carpenter's and joiner's work. But these qualities alone are not sufficient to explain the systematic use of oak. The possibilities offered by environmental conditions must also be considered. In fact, deciduous oak is the key-taxon for the different vegetation levels (mesomediterranean, supramediterranean) of all the sites studied. It is in the vicinity of their villages that peasants and craftsmen select the most suitable species for construction. This is also the cheapest choice: gathering of wood stocks from neighbouring areas avoids costly and long transport. For castral sites isolated and perched, it was an indispensable condition. In the plains also, where villages are situated near markets and integrated in commercial and economical relationships, the same choice has been effectuated (even in the XIVth-XVIth centuries).

Anthracological diagnosis also reveals that builders did not use any kind of oak tree. The meticulous observation of charcoal transverse section proves it. At Le Mourrel, the average width of growth rings is 3 mm which results from a normal growing rate. In this case, wood may have little value due to lower technological qualities (cutting up, work), but, on the other hand, it has good mechanic properties : growth rings widths did not present significant variations, which is an important quality standard (Venet, 1974).

At Oze, traces of squaring had been clearly observed. However the tool used to carry out this work left no characteristic traces on remains. The same happens at Niozelles (tabl.2), but further information is obtained. Usually, almost all vessels of the deciduous oak are obstructed with tyloses which, when not traumatic, are characteristic of old woods. Growth ring arches are not very marked which may indicate the presence of trunks rather than branches. It is possible that wood was collected in forest stands and mature formations.

Some charred fragments were very well preserved and allowed further conclusions. At Niozelles, the orientation of ligneous fibers and growth rings boundaries towards the orientation axis of artifacts are characteristic of a specific way of carving wood known as " cutting up on slabbing off-cut ". This kind of wood work consists in cutting the wood along the trunk's length instead of following the rays. For J.-Y. Hunot (Hunot 1992), this procedure is characteristic of sawing with parallel traces of a saw. This agrees with the interpretation put forward by the archeologist, D. Mouton, according to whom these are remains of timber (beams, butten....). At Cabrières, in the XVIth century, the quality of charcolified pieces is such that an estimation of wood sections and sizes has been effectuated. The observation and measure of growth rings curvature make it possible to calculate minimal diameters (Fig.3). This is obviously an estimation because the charcoal pieces may come from a bigger trunk or be warped while on fire. Whenever diameter estimations were made possible, the size of oak pieces was always the most important. In the same way, construction remains made out of deciduous oak have bigger dimensions. In the Mediterranean area, this tree can easily grow up to twenty meters high providing that the formation is not treated as coppice or coppice under forest : in this last case, the shoots are small (under 10 m high) and have a middling section. At Cabrières, bark came either from "spring from coppiced stools" with 15 or 20 years between each cutting or from a protected vegetal formation treated as fully-grown trees.

All these observations emphasize the idea that timber had been carefully chosen and seriously examined. Therefore, peasants adapted their needs to their environmental possibilities: either they had preserved the forest or they developed strategies of forest management to obtain long bearings.

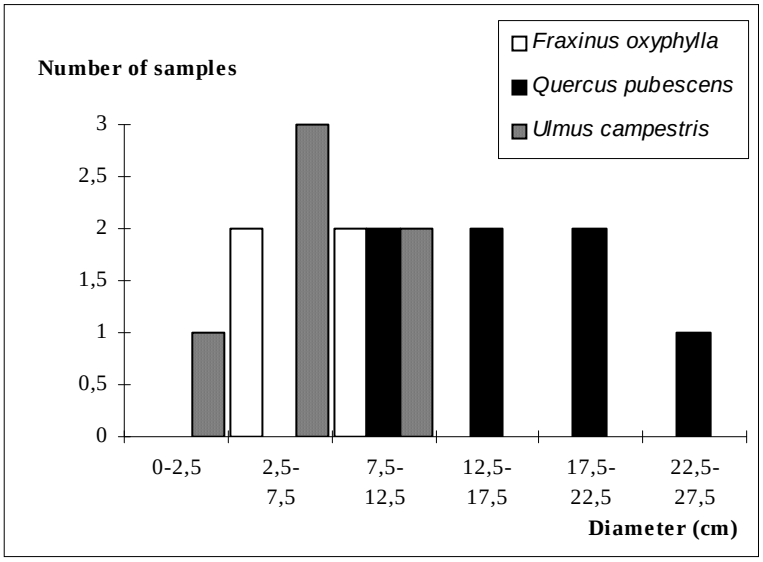

Fig. 3 Minimal diameter of timbers at Cabrières (XVIth).

2.- The other timbers

Anthracological analysis of timber remains show that the remaining species used for building appear only occasionally. They are not used in the majority of artifacts ; they are not recognized in all archeological sites analysed. In sites close to the biogeographic mountainous level, conifers are present: at Oze, *Abies alba* and *Pinus sp*. are identified while at Mézenc (Ardèche, 07), only *Abies alba* has been found for the moment. Compression wood has been observed in nearly all the samples : the alpine conditions may explain the formation of these tissues. In southern sites, the presence of *Fagus sylvatica, Ulmus minor, Salix sp.* and *Castanea sativa* is attested. Important frequencies of riverside taxa are noted. These species might have been carefully selected. They provide good wood and very long monospecific bearings. *Ulmus minor* and *Fagus sylvatica* are suitable for the heavy structure of buildings, but not for the roof-piece : at Cabrières, trees assigned to these species seem to have reached smaller average dimensions than deciduous oak. Under Mediterranean climatic conditions, beech wood becomes heavy and hard (classes 7,8,9), and can be treated as a timber (Venet, 1974). On the other hand, willow and poplar are very soft woods, inadequate to the mechanical needs of heavy building. Their selection might have answered specific and punctual needs, such as minor armature, pegs, repairs, penury, mortise-and-tenon.. The flexible wood of ash, with fine texture, is usually chosen for this last coupling. The wood of Mediterranean ash is dense (classes 7 and 8), and therefore hard and may be used in carpentry (Venet 1974).

At Niozelles, three other species were identified: *Buxus sempervirens* and *Sorbu sp.-Crataegus sp*. These woods have a short durability but are hard enough to be used in joiner's work or cabinetwork. However, hawthorn is marginal in this use. The three samples identified as *Rosaceae* are well cut: the section (2 cm) is quadrangular, 2-3 cm long, in the shape of a peg. *Buxus sempervirens* has a good durability and is a very hard wood. These remains are smaller than those of deciduous oak. The use seems specific and not usual, probably to join together other different pieces or to complete a structure.

Conclusion

The spectrum of woods used in southern rural buildings is quite large as shown by taxa recognized: *Castanea sativa, Quercus* deciduous, *Fraxinus sp., Fagus sylvatica, Ulmus minor, Salix sp.-Populus sp., Pinus* type *sylvestris, Abies alba*. However, despite this relative diversity, one species is mainly used as a result of

technical, economical, biogeographical reasons – deciduous oak. The others are used occasionally to answer specific needs or because of their abundance and proximity. In fact, all species used grow in the vicinity of the sites: exterior origin of timber has not been documented. Villagers, builders or other specialist workers adapt their needs to the local possibilities: they choose the most suitable woods but also the cheapest ones. They have also carefully chosen and seriously examined timber. They seem to have developed forestry strategies, with management forest practices. Further charcoal analyses will confirm and enrich these first data and a better understanding of wood uses during the medieval period will be achieved

BIBLIOGRAPHY

BESANÇON 1973 - *La construction au Moyen Age. Histoire et archéologie*, Actes du 2ème congrès de la Société des Historiens médiévistes de l'Enseignement supérieur public tenu à Besançon les 4-6 juin 1972, Besançon, Annales littéraires de l'Université de Besançon, Paris, Les Belles Lettres.

CHABAL L. 1997 - *L'anthracologie, de l'échantillonnage des charbons de bois à l'interprétation du paysage du Néolithique final à la période romaine en Bas-Languedoc*, Paris, Maison des Sciences de l'Homme, (Documents d'archéologie française, 63), 192 p., 64 fig., 14 tabl.

COLIN M.-G., DARNAS I., POUSTHOMIS N., SCHNEIDER L. (coord.), 1996- *La maison du* castrum *de la bordure méridionale du Massif central,* Archéologie du Midi médiéval, supplément n°1, Carcassonne, Centre d'Archéologie médiévale du Languedoc, 221 p.

DÉMIANS D'ARCHIMBAUD G. 1980 - *Les fouilles de Rougiers (Var)*, Paris, C.N.R.S., 724 p.

DIETRICH A. 1989 - *Problèmes d'archéologie et d'ethnohistoire liés à la conservation des bois (étude des bois archéologiques médiévaux du Bassin parisien)*, Thèse de l'Université de Paris I Panthéon-Sorbonne, 2 vol., 477 p.

DURAND A. 1998 - *Les paysages médiévaux du Languedoc (Xe-XIIe siècles)*, Toulouse, Presses universitaires du Mirail, 491 p., 61 fig., 34 tabl.

ESQUIEU Y. et PESEZ J.-M. (dir.) 1998 - *Cent maisons médiévales en France du (XIIe au milieu du XVIe siècle). Un corpus et une esquisse*, Paris, C.N.R.S. Editions, Monographie du C.R.A., 450 p., 406 fig.

GARNIER B., GARNOTEL A., MERCIER C. et RAYNAUD C. 1995 - De la ferme au village : Dassargues du Ve au XIIe siècle (Lunel, Hérault). *Archéologie du Midi médiéval*, t.XIII, p.1-73.

GINOUVEZ O. 1993 - Des maisons excavées à Narbonne autour de l'an Mil. *Archéologie du Midi médiéval*, t.XI, p.53-68.

HUNOT J.-Y. 1992 - Charbons de bois recueillis à l'intérieur de vases funéraires. Approche ethnobotanique. *Les charbons de bois, les anciens écosystèmes et le rôle de l'homme (Montpellier 10-13 septembre 1991), Bulletin de la Société botanique de France*, t.CXXXIX, 2-3-4, p.651-658.

MERCIER C. et RAYNAUD C. 1995 - L'habitat rural en Gaule méridionale méditerranéenne aux VIe-VIIe s. Approche régionale et étude de cas. LORREN C. et PERIN P. (ed). *L'habitat rural du Haut Moyen Age (France, Pays-Bas, Danemark et Grande-Bretagne)*, Actes des Journées internationales d'Archéologie mérovingienne Guiry-en-Vexin et Paris, 4-8 février 1993, Rouen, Association française d'Archéologie mérovingienne, p.193-206.

PESEZ J.-M. 1965 - Les villages désertés en France : vue d'ensemble. *Annales Economies, Sociétés, Civilisations*, t.XX, n° 2, mars-avril, p.267-290.

SCHNEIDER L., PAYA D. et FABRE V. 1995 - Saint-Sébastien-de-Maroiol (34) et l'histoire de la proche campagne du monastère d'Aniane (V-XIIIe s.). *Archéologie médiévale*, t.XXV, p.133-181.

RACKHAM O. 1980 - *Ancient Woodland, its history, vegetation and uses in England*, London, E. Arnold, 402 p.

RUAS M.-P, in press - *Productions agricoles, stockage et finage en montagne noire médiévale. Les récoltes incendiées au XIVe siècle du grenier castral de Durfort (Tarn)*, Paris, Maison des Sciences de l'homme, collection Documents d'Archéologie française.

THERY I. 1983 - *Les déformations anatomiques des charbons de bois : implications archéologiques (sites des Canalettes et des Usclades, Aveyron)*, D.E.A., Université des Sciences et Techniques du Languedoc (Montpellier II), 80 p.

VENET J. 1974 - *Identification et classement des bois français*, Paris, Engref, 300 p.

VILLAGES 1965 - *Villages désertés et histoire économique XIe-XVIIIe siècles*, Paris, SEVPEN (Les hommes et la Terre, 11)